

**FABRICS HAVING STIFF FIBERS AND HIGH-ABSORBABLE FIBERS
ALTERNATELY ARRANGED AND MOP THEREOF**

[Technical Field]

5 The present disclosure relates to a fabric having stiff fibers and high-absorbable fibers and a mop cloth using the same.

[Background]

10 Conventional fabrics, even though they are developed for cleaning, are generally constructed to provide absorbancy or high absorbancy so that they can be used only for exclusive wiping to remove fine dust while being wet or not being wet. Therefore, most of the ordinary cleaning work is conducted by separately sweeping a surface to be cleaned with a broom or a vacuum cleaner prior to wiping with a cloth (such as those commonly used for wiping, for example a duster). Thus, in case of an ordinary cleaning
15 of an indoor place, at least two operations: sweeping and wiping, are sequentially carried out, which makes the cleaning vexatious.

 Furthermore, conventional mop cloths are fixed onto a holder part of a mop stick using a separate jig disposed at the holder part and should be separated from the holder part for washing.

20 Accordingly, the present inventors have developed a novel fabric which can conduct sweeping and wiping at the same time for cleaning of an indoor space where contamination is not heavy.

Summary

25 The present disclosure provides a fabric with stiff fibers and high-absorbable fibers, alternately arranged, which has a structure comprising a stiff fiber region and a super-absorbent fiber region alternately arranged so that sweeping and wiping can be carried out simultaneously in a single cleaning.

The present disclosure also provides a mop cloth, comprises the aforementioned fabric with stiff fibers and high-absorbable fibers alternately arranged, and a sheet with a fastening means on its surface, such as a reclosable hook and loop web such as a Velcro brand tape, fixed to one side of the fabric (by overlocking or stitching), such that the mop cloth can be rapidly and readily separated from and attached to a mop stick, particularly a mop cloth holder, connected to the lower end of the mop stick by a hinge.

In accordance with the present disclosure, the stiff fibers used to make the fabric with stiff fibers and high-absorbable fibers may be stiff fibers of polypropylene, polyethylene, polyester, nylon and the like, and the high-absorbable fibers may be polyester microfibers, polyester-nylon composite microfibers and the like having a size of 1.0 denier or less. The fibers are weaved/knitted and processed according to a known method, such as circular-knitting, weaving or tufting, in such a manner that a stiff fiber region of aggregated stiff fibers, and a super-absorbent fiber region of aggregated high-absorbable fibers are alternately arranged.

Also, the fabric according to the present disclosure has an area ratio of the stiff fiber region to the super-absorbent fiber region of 10 to 50: 50 to 90.

The mop cloth comprises the fabric, cut to a predetermined area, and a sheet with a fastening means on its surface, sequentially laminated on the fabric, in which the fabric and the sheet are joined at their margins by overlocking or stitching with a cloth wrapped around their margins. It can be used as a mop cloth which can be readily attached to and detached from a mop stick.

Also, in the mop cloth, the fastening means formed on one surface of the sheet is a hook part of a loop part of a reclosable, hook and loop tape such as Velcro brand tape.

Therefore, by using the fabric according to the present disclosure having a structure comprising a stiff fiber region and a super-absorbent fiber region, alternately arranged, to conduct sweeping and wiping at the same time, it is possible to more effectively and conveniently perform sweeping and wiping at the same time to complete a cleaning operation in a single swabbing.

Further, by using the mop cloth according to the present disclosure, it is possible to more rapidly and readily accomplish the attachment of the mop cloth to a holder connected to one end of a mop stick by hinge or detachment therefrom.

5 [Brief Description of the Drawings]

Fig. 1 is a plan view illustrating a fabric having stiff fibers and high-absorbable fibers, alternately arranged, according to the present disclosure;

Fig. 2 is a perspective view illustrating a mop cloth using the fabric having stiff fibers and high-absorbable fibers, alternately arranged, according to the present disclosure; and

Fig. 3 is a perspective view illustrating an example of a mop cloth according to the present disclosure, in which the mop cloth is about to be attached to a mop cloth holder connected to a mop stick.

15 Detailed Description

Now, the present disclosure will be described in detail hereinafter in conjunction with the accompanying drawings.

Fig. 1 is a plan view illustrating the fabric having stiff fibers and high-absorbable fibers, alternately arranged, according to the present disclosure, Fig. 2 is a perspective view illustrating a mop cloth using the fabric having stiff fibers and high-absorbable fibers, alternately arranged, according to the present disclosure , and Fig. 3 is a perspective view illustrating an example of a mop cloth according to the present disclosure, in which the mop cloth is about to be attached to a mop cloth holder connected to a mop stick.

Referring to Fig. 1, a fabric 10 with stiff fibers and high-absorbable fibers, alternately arranged, is manufactured and processed by circular-knitting, weaving or tufting stiff fibers, for example, polypropylene, polyethylene, polyester, nylon and the like, and high-absorbable fibers, for example polyester microfibers, polyester-nylon composite microfibers of 1.0 denier or less, according to a known method, in which the

fabric has a structure comprising a stiff fiber region 11 of aggregated stiff fibers and a super-absorbent fiber region 12 of aggregated, high-absorbable fibers alternately arranged.

The term "stiff fibers", as used herein, refers to long fibers which are yarns having physical properties such as a high bending strength and a high resiliency and are typically obtained by thickly spinning vinylic synthetic fibers. In the present disclosure, the stiff fibers are not limited by raw materials of fibers but any stiff synthetic fiber can be used. Examples of stiff fibers which can be preferably used in the present disclosure include polypropylene fibers, polyethylene fibers, polyester fibers and nylon fibers. Particularly, the polypropylene fibers have little water absorbancy, high resiliency and excellent mechanical properties.

The high-absorbable fibers refer to fibers of a high water retention rate, such as polyester microfibers or polyester-nylon composite microfibers having a diameter of 1.0 denier or less. Preferably, examples of the high-absorbable fibers include polyester fibers that can be readily formed into microfibers by spinning and splitting. It should be understood that the high-absorbable fibers useful in the present invention can be any of the known commercially available from domestic and foreign companies.

According to the present disclosure, the fabric 10 has a structure, in which the stiff fiber regions 11 comprising aggregated stiff fibers and the super-absorbent fiber regions 12 comprising aggregated high-absorbable fibers are alternately arranged to each other by circular-knitting, weaving and tufting according to a known method.

The fabric 10 can be manufactured by circular-knitting, weaving and tufting the stiff fiber region 11 of aggregated stiff fiber and the super-absorbent fiber region 12 of aggregated stiff fiber according to a known method, in a fashion that alternately arranges the stiff fiber region 11 and the super-absorbent fiber 12 with each other. That is, the structure of the fabric 10 according to the present disclosure can be accomplished by controlling the arrangement of the general fibers introduced to a knitting or weaving machine.

In the fabric 10 according to the present disclosure, the stiff fiber region 11 functions as a broom for sweeping and the super-absorbent fiber region 12 functions as a duster for wiping. Since the fabric 10 according to the present disclosure has a structure comprising the stiff fiber region 11 and the super-absorbent fiber region 12 alternately arranged, when a user swabs the floor of an indoor place with the fabric 10, sweeping and wiping required for cleaning operation can be done at the same time and thus the user can carry out the sweeping and wiping operations simultaneously in a single swabbing operation.

Of course, it may be preferable to remove filth or dirt of a big size with a vacuum cleaner or the like prior to cleaning with the fabric 10, when contamination is heavy. However, in case of cleaning most indoor places, particularly floors or rooms of oriental houses, the sweeping and wiping operations can be conveniently conducted by a single swabbing with the fabric 10 to complete the cleaning.

Also, in the fabric 10 comprising stiff fibers and super-absorbent fabrics, the area ratio of the stiff fiber region 11 to the super-absorbent fiber region 12 is 10 to 50:50 to 90.

Preferably, the stiff fiber region 11 has an area proportion of 10 to 50% relative to the super-absorbent fiber region 12. This is because the sweeping operation only pushes out dust and dirt to one side while the wiping operation adsorbs minute dust directly onto the super-absorbent fiber region 12. Thus, the super-absorbent fiber region 12 used for wiping operation during the cleaning is preferably larger than the stiff fiber region 11 used for sweeping operation.

However, when the stiff fiber region 11 is less than 10% based on the total area of the fabric 10, the sweeping operation cannot be carried sufficiently. When it exceeds 50%, the wiping operation is not carried out sufficiently and the fabric 10 should be washed for subsequent use.

Particularly, as shown in Fig. 2, the fabric 10 according to the present disclosure, cut to a predetermined area, is provided and a sheet 14 with a fastening means 15 formed on one surface thereof is laminated on the fabric 10 in such a manner that the surface

formed with the fastening means is exposed to the outside. The laminate of the fabric 10 and the sheet 14 is overlapped at its margin or stitched with a cloth wrapped around the margin to form a mop cloth with a finishing region 13. By the treatment of overlapping or stitching with a cloth wrap, it is possible to produce a duster or mop cloth of a woven or knitted fabric which can maintain an original shape without fraying at the margin.

The fastening means formed on one surface of the sheet 14 can be selected from a hook part or a loop part of a reclosable hook and loop tape, such as Velcro brand tapes.

Fig. 3 is a perspective view illustrating an example using a mop cloth 16 using the fabric having stiff fibers and high-absorbable fibers, alternately arranged, according to the present disclosure; in which the mop cloth 16 is to be attached to a mop cloth holder connected to a mop stick. A holder 19 having a predetermined area is connected to an end of a mop stick by a hinge in such a manner as to be rotated back and forth and right and left. At the bottom of the holder 19, there is formed a mate part of the reclosable, hook and loop tape (e.g., Velcro brand tape) 15 to be fastened to the other part of the reclosable, hook and loop tape (e.g., Velcro brand tape) 15 provided on the sheet 14 of the mop cloth 16. Accordingly, the mop cloth 16 can readily attached to and detached from the holder 19 of the mop.

Examples

Example 1.

500d/11f dope-dyed polypropylene filament yarn, 100d/192f 4-ply polyester microfiber yarn (185tpm) and 150d/144f 3-ply polyester microfiber yarn(185tpm) were knitted on a circular knitting machine for knitting a pile fabric with an areal ratio of the fibers of 30:35:35. The resulting piles were cut, scoured and dyed in a high-pressure jet dyeing machine. The backside of the fabric was coated with polyurethane so that the pile did not fall out. Thus, the knitted pile fabric with a stiff fiber region and a super-absorbent fiber region according to the present invention was fabricated.

The knitted fabric thus obtained was cut into pieces with a predetermined size and each piece was laminated with a sheet having a Velcro brand tape as fastening means

formed on a surface. The resulting laminate was finished with overlocked seams at its edge to form a dustcloth.

Example 2.

5 500d/11f 6-ply dope-dyed polypropylene filament yarn, 150d/144f 20-ply polyester microfiber yarn were knitted on a Tufting machine to form a pile fabric with an areal ratio of the fibers of 15:85, followed by cutting. The backside of the fabric was coated with polyurethane so that the pile did not fall out. Thus, the woven pile fabric with a stiff fiber region and a super-absorbent fiber region according to the present invention
10 was fabricated.

 The woven fabric thus obtained was cut into pieces with a predetermined size and each piece was laminated with a sheet having a Velcro brand tape as a fastening means formed on a surface. The resulting laminate was finished with overlocked seams at its edge to form a dustcloth.

15 The fabric having a structure comprising a stiff fiber region and a super-absorbent fiber region, alternately arranged, to conduct sweeping and wiping at the same time upon the cleaning of an indoor place according to the present disclosure is suitable for a duster to conduct sweeping and wiping at the same time for cleaning of an indoor space where contamination is not heavy.